

REMARKS

The Applicant's representative has carefully reviewed and considered the Office Action mailed on April 16, 2003, as well as the references cited therewith. Claim 21 has been amended, no claims are canceled, and no claims are added. As a result, claims 2-7 and 9-21 are now pending in this application.

§112 Rejection of the Claims

Claim 21 was rejected under 35 USC § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention, since claim 21 depended from canceled claim 1. The Applicant appreciates the Examiner's observation in this regard.

Claim 21 has now been amended to depend from independent claim 2, and to correct the term "conductor". It is respectfully noted that the amendment is not related to reasons of patentability, but merely to correct typographical errors. This amendment should resolve the Examiner's concerns with respect to claim 21, and the Applicant therefore respectfully requests reconsideration and withdrawal of the rejection under 35 USC § 112.

§103 Rejection of the Claims

Claims 4, 5 and 19 were rejected under 35 USC § 103(a) as being unpatentable over IBM Technical Disclosure Bulletin, Vol. 20, no. 8, pp. 3117-3118, 1978 (hereinafter "3117"). Claims 2, 3 and 21 were rejected under 35 USC § 103(a) as being unpatentable over '3117 in view of Herrell (U.S. Patent No. 6,191,479, hereinafter "Herrell"). Since a prima facie case of obviousness has not been established in each case, the Applicant respectfully traverses these rejections.

The Examiner has the burden under 35 U.S.C. § 103 to establish a prima facie case of obviousness. *In re Fine*, 837 F.2d 1071, 1074, 5 U.S.P.Q.2d (BNA) 1596, 1598 (Fed. Cir. 1988). In combining prior art references to construct a prima facie case, the Examiner must show some objective teaching in the prior art or some knowledge generally available to one of ordinary skill

in the art that would lead an individual to combine the relevant teaching of the references. *Id.* The M.P.E.P. contains explicit direction to the Examiner that agrees with the *In re Fine* court:

In order for the Examiner to establish a *prima facie* case of obviousness, three base criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. M.P.E.P. § 2142 (citing *In re Vaeck*, 947 F.2d 488, 20 U.S.P.Q.2d (BNA) 1438 (Fed. Cir. 1991)).

The fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. *In re Mills*, 16 USPQ2d 1430 (Fed. Cir. 1990); M.P.E.P. § 2143.01. That is, unless all three of the conditions described in M.P.E.P. § 2142 are met, a *prima facie* case of obviousness is not established, and rejection under 35 U.S.C. § 103 is improper. The requirement of a suggestion or motivation to combine references in a *prima facie* case of obviousness is emphasized in the Federal Circuit opinion, *In re Sang Su Lee*, 277 F.3d 1338; 61 U.S.P.Q.2D 1430 (Fed. Cir. 2002), which notes that the motivation must be supported by evidence in the record.

With respect to claims 4, 5, and 21, it is admitted in the Office Action that '3117 does not disclose the material composition of the conductive or insulator layers in a capacitor, as claimed by the Applicant. It is then asserted that "it is well known in the capacitor art to form" insulating layers from a BaSrTiO₃ material. The Applicant respectfully disagrees.

While it is asserted in the Office Action that BaSrTiO₃ may be used as an insulator, as shown by some references, it has also been noted by the Applicant that other references (e.g., Farooq et al., previously cited by the Office) teach away from the use of BaSrTiO₃ as an

insulator, since it is noted that a low-K material can be key to the construction of a capacitor. (e.g., see Farooq et al. col. 5, lines 27-32).

“Obvious to try” is not a proper standard for determining obviousness. In re Fine, 5 U.S.P.Q.2d 1596 (Fed. Cir., 1988). “One cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention.” In re Fine, 5 U.S.P.Q.2d 1596, 1600 (Fed Cir., 1988). It should also be noted that if an independent claim (i.e., claim 4) is nonobvious under 35 U.S.C. § 103, then any claim depending therefrom (i.e., claim 5) is nonobvious. See M.P.E.P. § 2143.03

Given the information provided by the Farooq reference, there appears to be no reasonable expectation of success in combining the claimed structure and BaSrTiO₃. Since, as noted above, the reasonable expectation of success must be found in the prior art, a *prima facie* case of obviousness has not been made with respect to claims 4, 5, and 21. Additionally, since no reference has been supplied to support the assertion that it is obvious to apply BaSrTiO₃ to the *claimed structure*, it appears the Examiner is using personal knowledge, and the Examiner is thus respectfully requested to submit an affidavit as required by 37 C.F.R. § 1.104(d)(2).

With respect to claim 19, it is admitted in the Office Action that ‘3117 does not disclose vias “extending through the substrate to provide electrical interconnection to both a top surface and a bottom surface of the ... capacitor.” It is then asserted that “it is well known in the capacitor art to extend vias through a substrate to provide electrical interconnections to both sides of the capacitive element” and that it would be obvious to “extend the vias of ‘3117 through the substrate to provide electrical interconnections to both sides of the capacitor, since such a modification would decrease the space needed in the electrical system.” The Applicant respectfully disagrees.

As noted previously, references must be considered in their entirety, including parts that teach away from the claims. MPEP 2141.02. Allowing conductive vias to penetrate the substrate in ‘3117 does not support an “exact correspondence in location to the voltage supply pads of the chip” as shown in FIGs. 1 and 2 of ‘3117. Since there is no need for the modification of ‘3117 suggested by the Office, and since such a change contradicts the teaching of the ‘3117 reference, no *prima facie* case of obviousness has been made with respect to claim 19.

Additionally, since no reference has been supplied to support the assertion that it is obvious to use penetrating conductive vias in conjunction with the *claimed structure*, it appears the Examiner is using personal knowledge, and the Examiner is thus respectfully requested to submit an affidavit as required by 37 C.F.R. § 1.104(d)(2).

It is noted in the Office Action that “one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references.” However, no combination of references has been presented in conjunction with the rejection of claims 4, 5, and 19 under § 103. This rejection is based solely on the disclosure by ‘3117. As noted above and admitted by the Office, ‘3117 does not disclose several elements in each of the rejected claims. Thus, this constitutes an additional reason as to why a *prima facie* case of obviousness has not been made with respect to claims 4, 5, and 19. Any other references which are to be combined with ‘3117 should be called out explicitly, and the *prima facie* case with respect to § 103 against each claim should be made in conjunction with the asserted combination of references and the requirements of the M.P.E.P. Since this has not been done, it is respectfully requested that the rejection of claims 4, 5, and 19 under be reconsidered and withdrawn.

Finally, with respect to claims 2-3, it is admitted in the Office Action that ‘3117 does not disclose controlled collapse chip connection (C4) lands fabricated on the third insulator layer. It is then asserted that Herrell teaches the use of C4 lands and that it would be obvious to “modify the capacitor of ‘3117 using the C4 lands as taught by Herrell, since such a modification would decrease the space used in the electrical system by placing the capacitor directly onto the chip” and form “multiple C4 lands which is [sic] fabricated in staggered columns in plain view, since such a modification would allow additional connections to the capacitor of ‘3117.” The Applicant respectfully disagrees.

The Office Action assertion overlooks the statement in the ‘3117 reference that “the tap-off pads 12 of the capacitor are distributed and exactly correspond in location to the voltage supply pads 14 of the chip,” as well as the placement of the chip 20 and capacitor 18 in FIG. 2 of the ‘3117 reference. No need is expressed in the ‘3117 reference to place the capacitor “directly on the chip.” In fact, placing the capacitor of ‘3117 as suggested by the Office would make it impossible to properly mount the chip to the circuit board shown in FIG. 2 of the ‘3117

reference. Thus, there is no motivation to combine the '3117 and Herrell references since the '3117 reference explicitly teaches away from such a combination.

Therefore, since the '3117 reference and Herrell do not disclose each and every element of the embodiments claimed by the Applicant, since the '3117 reference teaches away from the combinations suggested by the Office, and since there is then no motivation to combine the references, it is respectfully requested that the rejection of claims 2-5, 19, and 21 under § 103 be reconsidered and withdrawn.

Allowable Subject Matter

The Applicant notes with appreciation that claims 6, 7 and 9-18 have been allowed. Claim 20 was objected to as being dependent upon a rejected base claim, but was indicated to be allowable if rewritten in independent form including all of the limitations of the base claim (i.e., claim 19).

AMENDMENT & RESPONSE UNDER 37 C.F.R. 1.116

Serial Number: 09/537274

Filing Date: March 29, 2000

Title: MULTI-LAYER CHIP CAPACITOR

Assignee: Intel Corporation

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Dkt: 884.240US1 (INTEL)

CONCLUSION

The Applicant respectfully submits that the claims are in condition for allowance and notification to that effect is earnestly requested. The Examiner is invited to telephone the Applicant's attorney, Mark Muller (210-308-5677), or the undersigned at 612-373-6970 to facilitate prosecution of this application. If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 19-0743.

Respectfully submitted,

LARRY E. MOSLEY

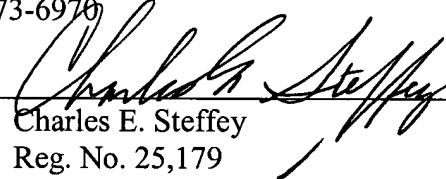
By his Representatives,

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Date

June 12, 2003

By


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CERTIFICATE UNDER 37 CFR 1.8: The undersigned hereby certifies that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail, in an envelope addressed to: MS RCE, Commissioner of Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on this 12 day of June, 2003.

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Signature

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